College of Engineering
UNIVERSITY OF GEORGIA

Capstone Senior Design Project Abstract

Project Title: Spray Quality Monitor for Informed Pesticide Applications

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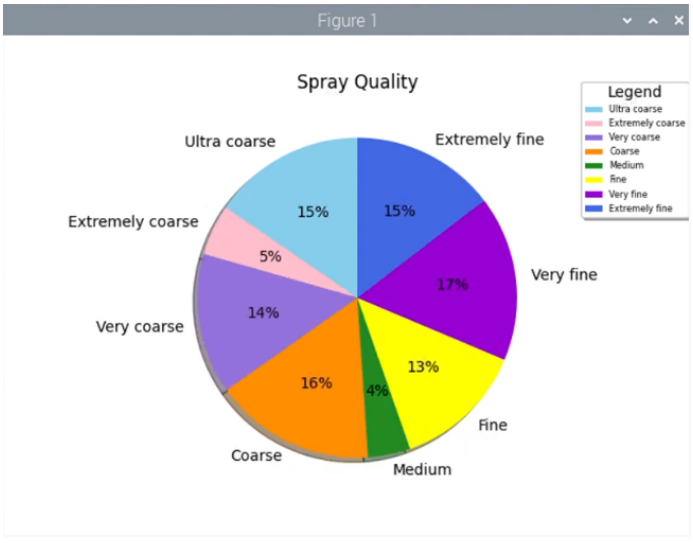
This project endeavors to create an embedded system that can provide real-time data acquisition of measured spray particles within pesticide spray applications. Monitoring spray applications consists of referencing spray card datasheets in which the Volume Median Diameter (VMD) value of a pesticide spray is used to classify the spray based on the median droplet type present within the spray sample. Though useful in a controlled environment, environmental disturbances and changes in the flow rate of the applicator can influence the particle size distribution of a pesticide spray and thus its VMD value. Additionally, since the particle size distribution of a pesticide spray can vary at the same VMD classification, relying on the VMD value alone is not sufficient to accurately assess the environmental impact of spray drift in a pesticide application. So, a means of measuring the particle size distribution of a pesticide spray in real-time is desired to provide more informed decision making for agriculturalists.

The scope of the design is to create a device that can measure the distribution of airborne pesticide spray particles within a spray sample, monitor particle size distribution in real time in the form of visual feedback to the user, and to mount the design onto a boom sprayer. The Spray Quality Monitor will not be responsible for suggesting ways in which the user can reach a specified VMD value or threshold for a particular particle size. The Monitor will not have any direct influence on the parameters of the applicator for the pesticide.

The software component of the design will produce a pie chart detailing the spray quality spectra to the user in real-time. The figure below demonstrates a simulation in which a pie chart illustrates particle sizes for various droplet types within a pesticide spray sample.



Spray Quality Distribution Pie Chart

Designing the Spray Quality Monitor so that it can accurately measure the VMD value of a pesticide spray will allow for the Monitor to be a reliable means of measuring particle size distribution. As a result, agriculturalists will be able to use the particle size distribution of a spray sample as an indicator to minimize the environmental impact caused by spray drift in pesticide spray applications.